PARTIAL COPY

SALT LAKE CITY CORPORATION

WESTSIDE MASTER DRAINAGE PLAN

VOLUME I - MASTER PLAN

PROJECT NUMBER 47-Q-19

October 1986

Salt Lake City Corporation
444 South State Street
Salt Lake City, Utah 84111

In addition to the above parameters the drainage system connecting each sub-basin would have to be defined in terms of length in feet and slope. A slope of 0.1 percent was used for proposed sections, whereas for existing open channel sections the actual measured grades were used.

Storm Characteristics

The model input parameters necessary to represent a design storm consists of duration, distribution, and depth. These factors are interrelated and are representative of the regional area being modeled.

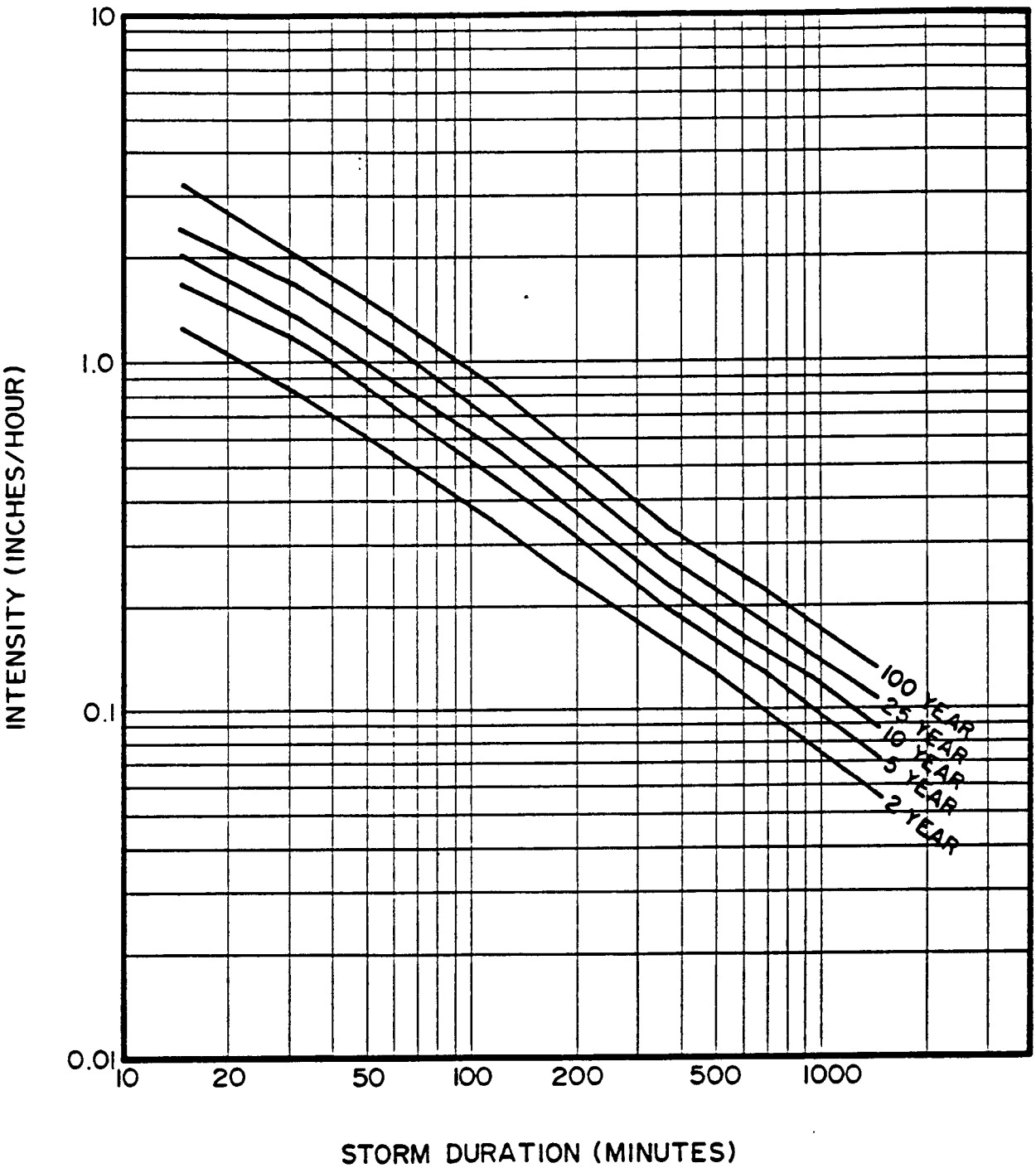
Duration. Cloudburst storms in the Salt Lake Valley are typically high intensity, short duration storms. These types of storms can cause significant runoff from developed urban basins. Storm durations ranging from 60 minutes to six hours have been commonly used in the past to represent design storm hyetographs along the Wasatch Front. Farmer and Fletcher (1971) reported that approximately 50 percent of the Wasatch Front cloudburst storms are 120 minute duration, while 25 percent of the storms are of 60 minute duration. Selection of a design storm duration should be based on factors such as basin size, the purpose of the study, and the runoff characteristics of the specific basin. As basin size increases, a longer storm duration can be justified in the analysis. A three-hour storm with a one-hour burst centered in the middle portion of the storm distribution was selected as the design storm. Using the ILLUDAS model storm durations of 1-, 2-, 6-, and 24- hours were also evaluated.

Depth. The rainfall values used in this study were obtained from the 208 report prepared by WeatherBank (1977). The 208 data was reportedly prepared from NOAA (1973) information and is presented specifically for the Salt Lake Valley area. Isoline maps were prepared to represent storm depths for different durations and storm frequencies.

Figure IV-2 illustrates the rainfall depth-duration-frequency curves used in this study. The point rainfall depths used to generate Figure IV-2 are listed in Table IV-1. The 10 and 100 year storm frequencies were examined in this study.

Distribution. Farmer and Fletcher (1972) investigated rainfall distribution of storms along the Wasatch Front. They were able to develop a distribution which was representative of about 88 percent of the 5200 storms they studied. The Farmer and Fletcher distribution was used for 1- and 2- hours storms in this study. The 6-hour SCS and the 24-hour Airport storm distributions were also examined. These distributions are shown in Figure IV-3.

A 3-hour storm distribution used in Salt Lake City Flood Insurance Study (FEMA, 1980) was selected for use in this study as the design storm distribution. This distribution produced higher peak flows than the other three distributions mentioned above. The Flood Insurance Study distribution has a one hour burst, based on the Farmer and Fletcher information, created in the second hour of a three-hour storm. A gradual upswing and downturn are used for the first and third hours respectively. This rainfall distribution is shown in Figure IV-4.



PRECIPITATION INTENSITY VS. DURATION	SALT LAKE CITY CORPORATION WESTSIDE MASTER DRAINAGE PLAN	FIG. IV-2

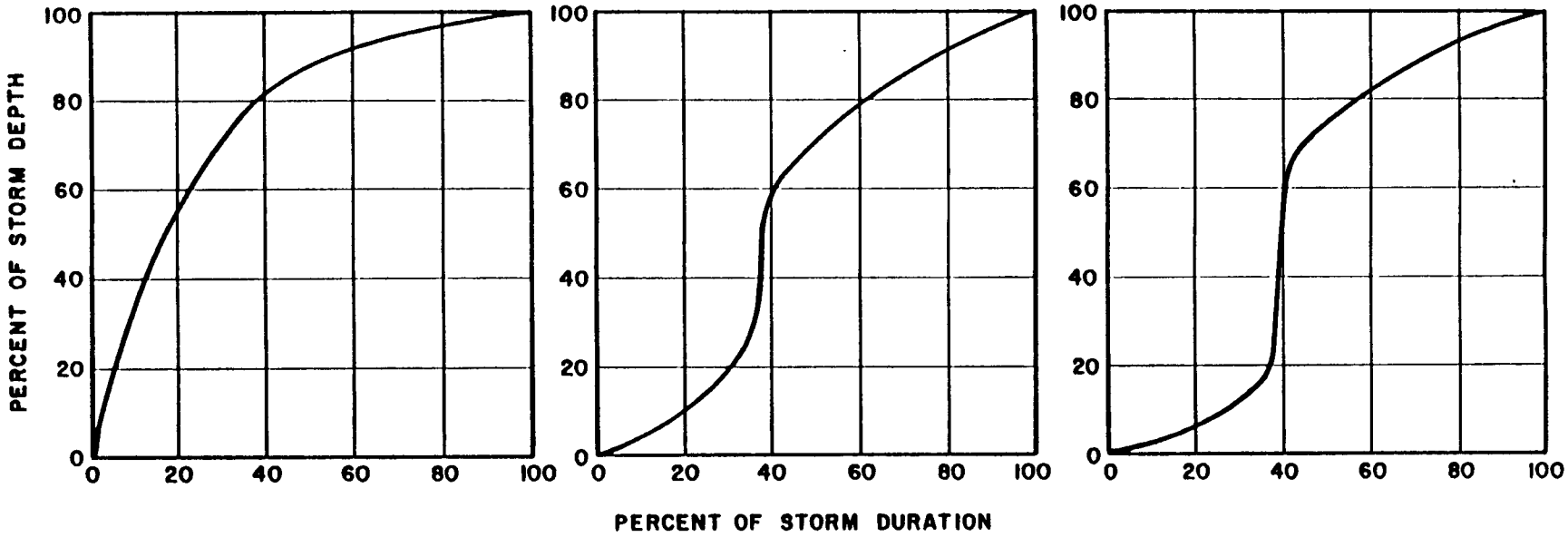
TABLE IV - 1

WESTSIDE DRAINAGE STUDY

POINT RAINFALL DEPTHS
(inches)

STORM DURATION	FREQUENCY				
	2-Year	5-Year	10-Year	25-Year	100 Year
15 min.	0.31	0.42	0.50	0.60	0.60
30 min.	0.42	0.60	0.70	0.85	1.06
1 hr.	0.55	0.75	0.90	1.10	1.35
2 hr.	0.68	0.90	1.10	1.30	1.68
3 hr.	0.76	1.03	1.20	1.45	1.80
6 hr.	0.95	1.20	1.40	1.65	2.00
12 hr.	1.15	1.50	1.75	2.06	2.60
24 hr.	1.35	1.76	2.10	2.54	3.15

Source: 208 Report Precipitation, Duration and Return Period Analysis, Salt Lake County, (WeatherBank, 1977).

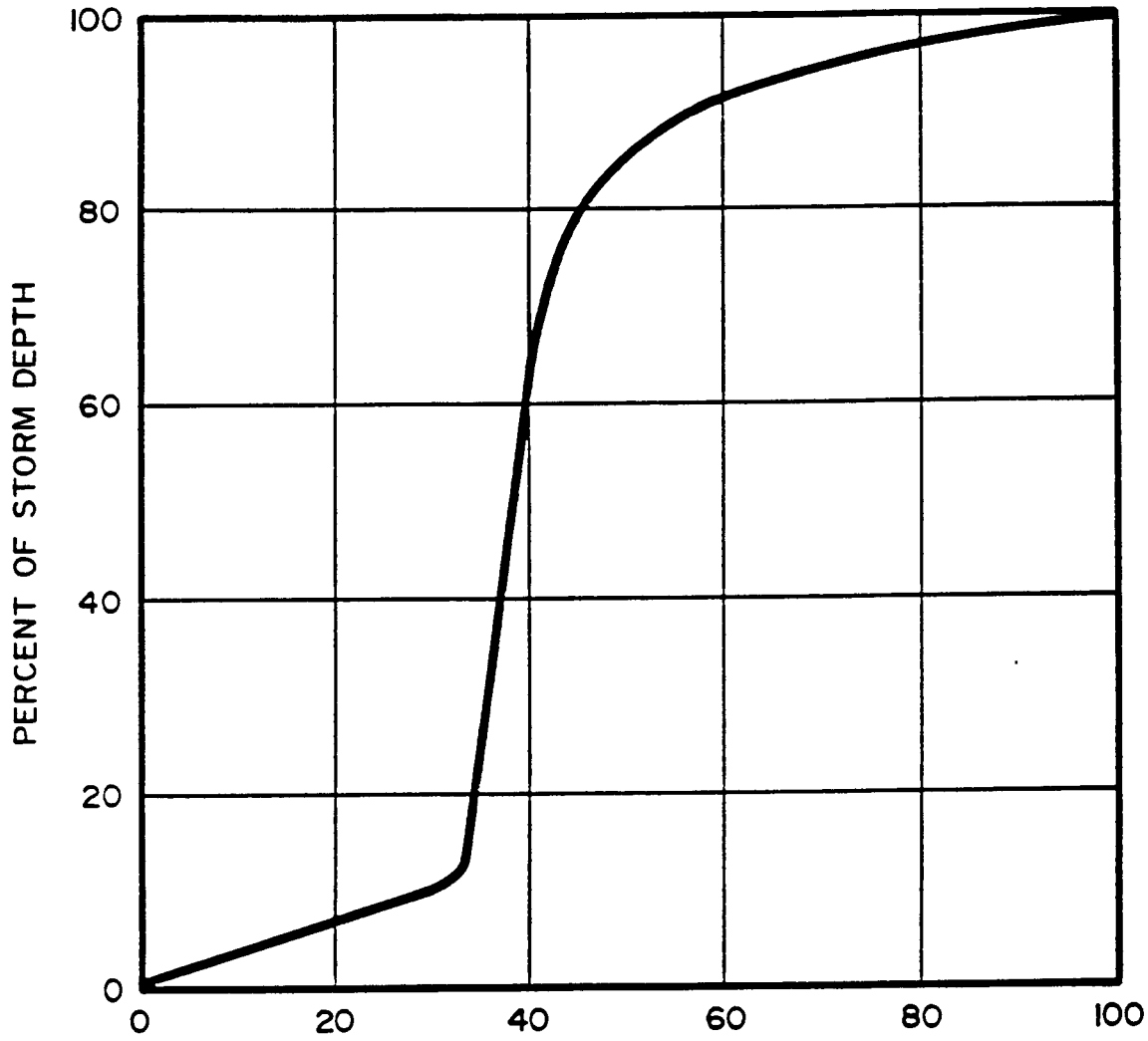


FARMER/FLETCHER DESIGN STORM
(SOURCE: DISTRIBUTION OF PRECIPITATION IN MOUNTAINOUS AREAS - EUGENE E. FARMER AND JOEL E. FLETCHER JULY 1972)

6-HOUR SCS DESIGN STORM
(SOURCE: SOIL CONSERVATION SERVICE)

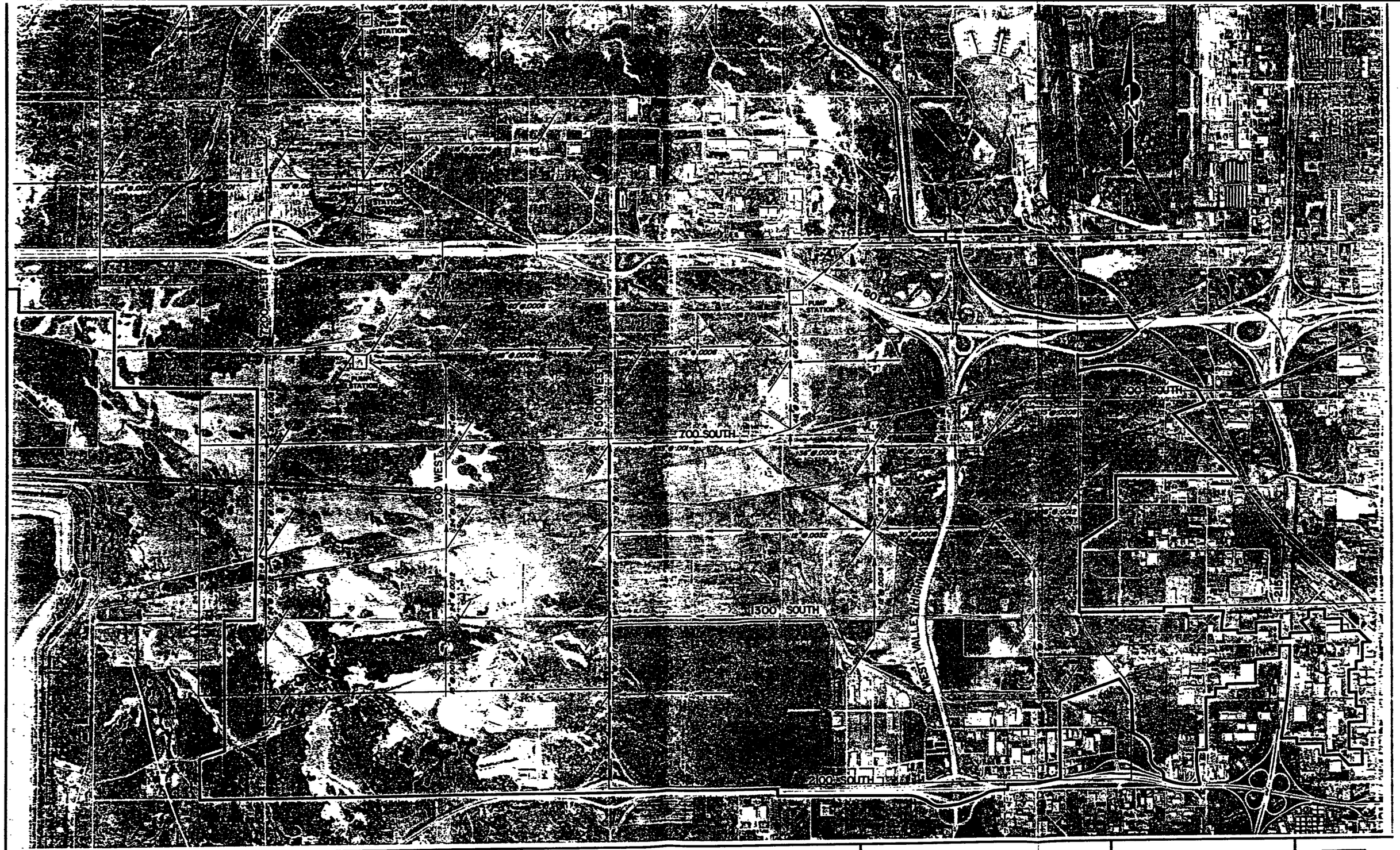
24-HOUR AIRPORT DESIGN STORM
(SOURCE: SALT LAKE CITY AIRPORT PRECIPITATION STATION DATA)

DESIGN STORM DISTRIBUTION	SALT LAKE CITY CORPORATION WESTSIDE MASTER DRAINAGE PLAN	FIGURE IV-3



3-HOUR DESIGN STORM
(SOURCE SALT LAKE CITY FLOOD INSURANCE STUDY - HYDROLOGY REPORT AUGUST, 1980)

3-HOUR DESIGN STORM DISTRIBUTION	SALT LAKE CITY CORPORATION WESTSIDE MASTER DRAINAGE PLAN	FIG. IV-4



LEGEND

PROPOSED SEWER LINE

PROPOSED WATER MAIN

STUDY LIMITS

DESIGNED	H.S.	DATE 9-86
DRAWN	B.R.K.	DATE 9-86
CHECKED	C.H.C.	DATE 9-86
REVISED		DATE
PHOTOGRAPHY O.A.S.		DATE 4-86

SALT LAKE CITY CORPORATION

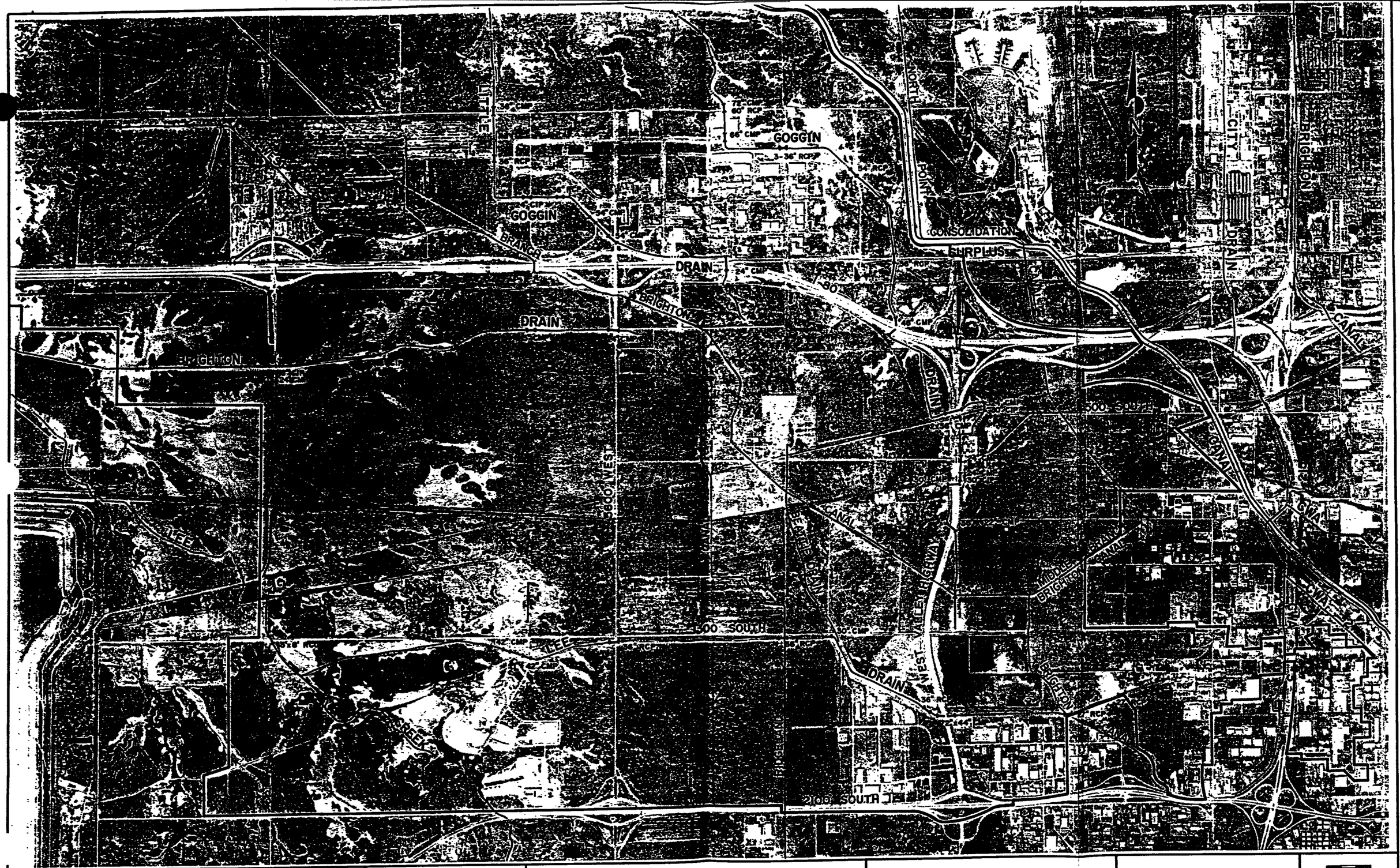
DEPARTMENT OF PUBLIC WORKS

WESTSIDE MASTER DRAINAGE PLAN

PROPOSED WATER & SEWER SYSTEMS

0 (FEET) 1500

FIGURE II-3-8



LEGEND

- PIPE
- DRAINAGE DITCH
- IRRIGATION DITCH
- STUDY LIMITS

DESIGNED	H.S.	DATE 9-86
DRAWN	B.R.K.	DATE 9-86
CHECKED	C.H.C.	DATE 9-86
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SALT LAKE CITY CORPORATION

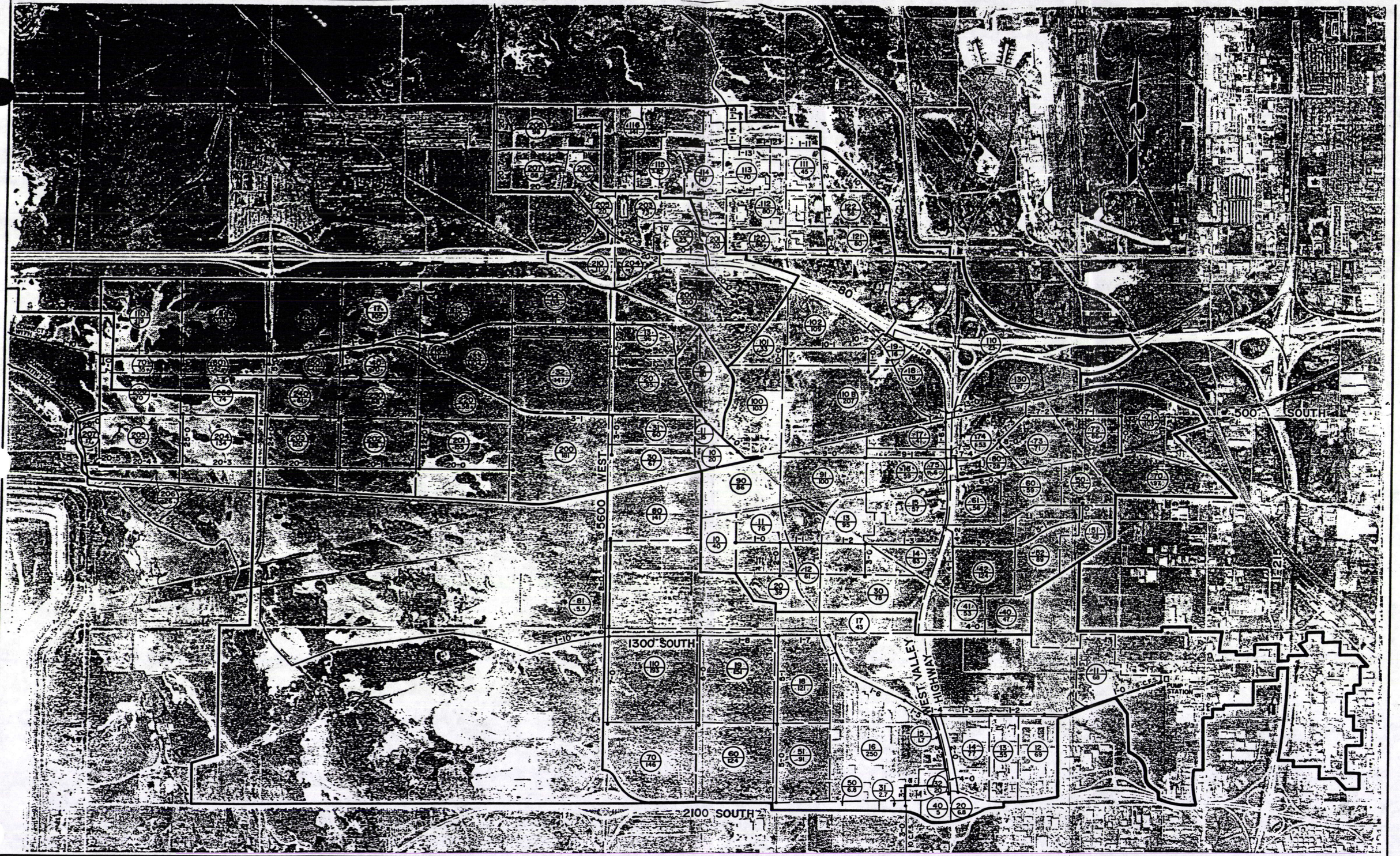
DEPARTMENT OF PUBLIC WORKS

WESTSIDE MASTER DRAINAGE PLAN

EXISTING DRAINAGE AND IRRIGATION SYSTEMS

0 (FEET) 1500

FIGURE II-4



LEGEND

- 20-1 — BRANCH – REACH PIPE SECTION
- (31/60) — SUBBASIN NUMBER ACREAGE
- MAJOR BASIN
- SUBBASIN
- STUDY LIMITS

DESIGNED	H.S.	DATE 9-86
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SALT LAKE CITY CORPORATION

DEPARTMENT OF PUBLIC WORKS

WESTSIDE MASTER DRAINAGE PLAN

BASIN BOUNDARY MAP

0 (FEET) 1500

FIGURE IV-1

SECTION IX

REFERENCES

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This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0350015 Mine Name KUC Tailings I
Operator Kennecott Utah Copper Date 2-17-1994
TO _____ FROM _____

__CONFIDENTIAL __BOND CLOSURE __LARGE MAPS X EXPANDABLE
__MULTIPUL DOCUMENT TRACKING SHEET __NEW APPROVED NOI
__AMENDMENT _OTHER _____

Description YEAR-Record Number

__NOI X Incoming __Outgoing __Internal __Superceded

Salt Lake City Corporation
Westside Master Drainage Plan
Volume I - Master Plan (Partial Copy)

___NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__TEXT/ 81/2 X 11 MAP PAGES __11 X 17 MAPS __LARGE MAP

COMMENTS: _____

CC: _____